**Structured Oxide - Based Reforming Catalyst Development**

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The U.S. Department of Energy is sponsoring the development of high temperature solid oxide fuel cell power systems for a variety of applications through its Solid State Energy Conversion Alliance (SECA) program. Diesel-fueled auxiliary power units are an important market segment for solid oxide fuel cell systems. Development of a catalyst which is stable and active for converting diesel fuel to a hydrogen-rich gas stream is an important aspect of the successful implementation of fuel cells for these applications. However, the high sulfur content along with aromatic compounds present in diesel fuel may deactivate the reforming catalysts. Deactivation of these catalysts by carbon deposition and sulfur poisoning is a key technical challenge. The National Energy Technology Laboratory (NETL) has been developing reforming catalyst based on the pyrochlore crystal structure to overcome the catalyst deactivation problem. Pyrochlore-based catalysts are of interest primarily due to their refractory nature and their stability in high temperature reducing and oxidative environments. A Rh-substituted zirconate catalyst supported onto zirconium-doped ceria (ZDC) successfully reformed diesel fuel for 1000 hrs under oxidative steam reforming conditions. For successful technology transfer, it is critical to apply the optimized pyrochlore catalyst used in the 1000 hr test onto a structured material to produce a commercially representative form (i.e., monolith, etc.). An alumina monolith structure coated with both the oxygen-conducting support and the active pyrochlore phase was fabricated and its performance was validated by short term partial oxidation (POX) tests on pump diesel, and in an integrated reformer-fuel cell test for 100hrs on a biodiesel fuel under oxidative steam reforming (OSR) conditions. The first generation of a coated, monolithic reactor has been fabricated and validated for reforming activity for diesel and biodiesel fuels. Optimization of the fabrication method is ongoing, and longer term testing will be conducted in the coming year.